which consists chiefly in the development of an excessive quantity of albumen, whilst in tuberculous diseases the fibrine is the element which is in excess both in the blood and in the morbid material poured out. This statement, however, is in the opinion of Heller merely hypothetical, and is based on evidence furnished by no direct chemical analysis, which alone can determine the question. Heller therefore took advantage of several cases of malignant affection of the uterus and vagina, which fell under his notice, and he examined carefully the blood passed by flooding, as also portions drawn directly from the arm. Omitting the particulars of the various cases, the general results only to which his researches led him need be here stated.

His microscopical examination of the blood proved the following chief points: 1st. That the blood corpuscles in cancerous disease always present a great variety in their size, some of them being smaller than natural, and others considerably above the average size; some are even three times larger than ordinary. The smaller ones are usually finely indented, granulated, or mulberry-like; the larger ones invariably smooth. This variety in size of the blood corpuscles, though always present in the blood in cancerous disease, is not peculiar to this kind of blood, for it also occurs in blood which contains pus. 2. That when blood is examined according to the method employed for the detection of pus in it, peculiar cells may be found in it, which correspond in form and other peculiarities to the ordinary cells of cancer. This is a fact which had not been hitherto made out, but about which there is now no doubt. 3. That in addition to the above peculiarities, there are observed by the microscope minute bodies of a more or less crystaline form, and possessed of a bright golden-yellow metallic lustre, which are most distinctly seen on darkening the field of the microscope. When viewed by transmitted light they appear in part colourless or yellowish, and in part of a bluish tint, showing a play of colours. These peculiar glittering particles may in most cases be distinguished with the naked eye after the blood has coagulated, appearing either as golden pellicles in the clot, or as glittering particles floating in the serum.

The chemical analysis of the blood furnished results equally decided in their nature. In the first place there was observed a constant, absolute, and relative increase in the quantity of *fibrine*, both in the hemorrhagic blood as well as in that withdrawn by venesection. The quantity of fibrine varied, and this variety was most marked in the metrorrhagic blood; sometimes in this latter the quantity amounted to as much as 13·42 parts in 1000: in one case even to 16·44 parts. In the blood drawn from a vein the quantity was always above natural, yet seldom greatly exceeded three parts in 1000. On comparing the quantity of fibrine in the blood discharged by hemorrhage from the uterus with that in the blood drawn by venesection, it would seem as if nature was endeavoring to get rid of a portion of excessively fibrinated blood by a spontaneous discharge from the uterus of blood loaded with fibrine. The *albumen* was present in its normal quantity, or if anything rather below it, so that there are no grounds for regarding the cancerous diathesis as an albuminous one, or for considering the cancerous material as composed of albumen. The quantity of *blood corpuscles* was always very small, both in the hemorrhagic blood as well as in that drawn from a vein. Sometimes the diminution of corpuscles was so great that complete anæmia of the body was found after death.

The view, therefore, that the cancerous diathesis is an albuminous one, and therefore opposed to the tuberculous diathesis, which is a fibrinous one, is completely erroneous, for the quantity of fibrine in the blood in cancerous affections is always in excess, and the diathesis therefore in such cases should be regarded as a fibrinous one, just as it is in tuberculous disease, where also an excess of fibrine (together with a diminution of red corpuscles), prevails in the blood.

This is another argument against the view of antagonism, which has been stated, though without good foundation, to exist between the cancerous and tuberculous diathesis.—*Lond. Med. Gaz.*, from *Heller's Archiv.*, 1846.

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5. *Analysis of the Urine, Blood, Fæces and Vomited Matters in Cholera Sporadica.* By Dr. Heller.—A case of sporadic cholera, which proved fatal, having come

under the notice of Heller, a careful examination was made by him of the blood and of the several excretions voided during life. The results of this examination are of considerable interest, inasmuch as hitherto but few, and these not very satisfactory, analyses of the various animal fluids in this disease have been published. The patient was a robust man, 30 years of age; he was attacked suddenly with severe and continued vomiting and excessive diarrhœa, which continued until his death, on the fourth day from the commencement of the disease.

The quantity of *urine* secreted was exceedingly small—not more than half an ounce in twenty hours. It was examined three different times, and the results of each analysis were the same. It was of a deep golden-yellow colour, and possessed a faint but very peculiar odour. When voided, it was tolerably clear, but shortly deposited a small quantity of flocculent mucus, and a fine sediment of earthy phosphates. It had a strong acid reaction; specific gravity 1018. The addition of nitric acid detected a large quantity of a peculiar animal matter, to which the deep colour of the urine was obviously due. When first the acid was dropt in, an intense violet-red colour was produced; this, on shaking, was changed to a dark carmine-red, and then to a dark violet, which remained. When a large quantity of acid was added, the colour assumed was a dark brown, which was permanent. These peculiar changes in colour produced by nitric acid were probably due to the presence of altered bile-pigment in the urine. Had the pigment been ordinary biliphœin, a green instead of a red colour would at once have been struck on the addition of the acid. Another effect produced by nitric acid was the evolution of a large quantity of gaseous carbonic acid. No albumen was detected. The addition of ammonia caused an almost entire disappearance of the earthy phosphates, and changed the golden yellow colour of the fluid to a brownish red.* The addition of a salt of silver to the acidulated urine showed that almost all the chlorides had disappeared. When the same salt was added to the non-acidulated urine, a precipitate was formed, which was soluble in nitric acid with an abundant evolution of carbonic acid gas. A salt of baryta detected very little of the sulphates, but also gave rise to an abundant disengagement of carbonic acid. On boiling, all the carbonic acid disappeared; which proved that the acid existed free in the urine, and that it was in all probability the chief cause of its high acidity. 1000 parts of the urine contained 955·67 parts of water, and 44·33 parts of solid constituents. Of the latter, 10·50 consisted of urea (12·8 being the average quantity in health), about 0·10 of uric acid, 27·32 of extractive matters, together with a large quantity of the peculiar animal substances above described, and which most probably originated from bile, 6·41 of fixed salts, which consisted in great part of phosphate of soda and sulphate of potash. With regard to the uric acid, it should be remarked that the crystals of it thrown down by the addition of hydrochloric acid had a square form, and were of a beautiful deep blue colour. When viewed by reflected light, these crystals presented a brilliant violet-red colour, with a metallic lustre, like that of titanium; by transmitted light, they appeared of a beautiful blue colour throughout, and formed a fine layer over the violet-coloured urine. This peculiarity of the uric acid crystals obviously resulted from their being combined with the pigment above described. For, in addition to the previously mentioned reasons for regarding this pigment as somewhat different to ordinary biliphœin, and as probably a modification of it, it may be stated that the crystal of uric acid, deposited through the action of hydrochloric acid from urine containing even a very large quantity of biliphœin, as in cases of intense jaundice, are never blue, but always yellow. The almost complete absence of chlorides from the urine is also very remarkable, since these, especially chloride of sodium, appear to fulfil an important part in the system. Lastly, the large quantity of free carbonic acid contained in the urine is a highly curious circumstance; true, it is often found largely in the urine, in combination with ammonia, but it is then a product of the decomposition of urea, and is coincident with an alkaline condition of the urine; but in this case there was no carbonate of ammonia present, and the urine possessed a highly acid reaction.

The blood which served for analysis was obtained from the carotid artery after death. It was generally fluid, though coagula were found here and there in the blood-vessels, and especially in the cavities of the heart. It was very dark, yet strongly coloured and of a tolerably thick consistence. The quantity of fibrine was very small. Beneath the microscope the blood corpuscles appeared indented, and many fat globules were observed. The serum, after the subsidence of the red corpuscles, was of a dark-yellow colour, and an alkaline reaction. It contained a full quantity of albumen, but not a trace of biliphœin could be detected. The quantity of fat was large; that obtained by ether and alcohol was perfectly saponifiable, and contained no cholesterine. When examined for urea by Simon's process, it was found to contain a very large quantity of this substance. This was manifestly the result of the great suppression of urine. The proportion of fixed salts in the blood was much increased, especially the quantities of the chlorides of sodium and of potassium, which were absent in so marked a degree from the urine. A similar circumstance was noticed by Phœbus.

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* **Vide Medical Gazette. New Series. Vol. i. p. 1089.**

The fecal evacuations, which were very abundant and frequent, were watery, and of a turbid whitish, gruel-like appearance; the fecal odour was but seldom perceived. They had an alkaline reaction, and contained albumen. By nitric acid their colour was changed to a deep brownish-red, which passed into violet, exactly resembling, therefore, the changes produced in the urine by the same reagent; ammonia also produced here the same dark brown-red colour as it did in the urine. The same peculiar substance, therefore, which was found in the urine, and regarded as altered bile-pigment, was present also in the fecal evacuations. Simon, also (as well as others), mentions this peculiarity of the bile in the feces of cholera, being frequently coloured red instead of green by nitric acid.* Crystals of ammonia and phosphate of magnesia were also found in the fecal evacuations in this case.

The matters vomited during the progress of the disease were very watery and of a greenish or yellowish-green colour, and had a slightly acid or neutral reaction. Bile was the most essential ingredient, and it reacted towards nitric acid as ordinary biliphœin would, the first change in colour produced by the acid being green.

In conclusion, it would seem as if in this disease a peculiar change or decomposition was undergone by the bile, and it would be important to ascertain whether a similar alteration of this fluid takes place in other cases.†—*Lond. Med. Gaz.*, Aug. 1846, from *Heller's Archiv.*

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6. *On the presence of large quantities of Fat in the Blood.* By Dr. Heller.—In a state of health, no free fat, in the form of fat globules, can be detected by the microscope in human blood; for the chief part of this ingredient, with the exception of cholesterine and seroline, exists in a saponified state. Inasmuch as chyle, however, after complete digestion, contains a considerable quantity of unsaponified fat, it follows that the free fat absorbed into the blood from this source must, during the metamorphosis which the blood undergoes, be converted into fatty acids. When, however, an inflammatory or other serious affection attacks any of the organs, which are largely concerned in the various metamorphoses which the blood undergoes, and the cells of which contain a considerable quantity of fat, as, for example, the liver, the kidneys, the lungs and the peritoneum, then much unsaponified fat may be found in the blood, and the serum has, in consequence, a more or less opaque milky aspect. This fat usually occurs as an emulsion, combined with albumen; and its peculiar appearance beneath the microscope, as well as its chemical characters, shows that the fat is neither saponified nor exists as an acid, nor even as free fat. The existence of milky serum in the blood has been noticed by Marcet in diabetes, by Trail in hepatitis, and by Christison in dropsy. The subject of the case which furnished the following observations was a robust, though not very corpulent, middle-aged man, who was admitted into the hospital for an attack of peritonitis. He was bled by venesection to about five ounces. The blood, when drawn, was of a tolerably bright-red colour, and sepa-

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* Animal Chemistry, Dr. Day's Translation, vol. ii., p. 383.

† In a note, Heller mentions having subsequently met with a case of Morbus Brightii and peritonitis, in which the same altered bile-pigment, as above described, was found in the urine.